REMARKS/ARGUMENTS

Claims 1-7 and 11-14 were pending in the present application before the amendment as set forth above.

This document is filed in reply to the Office Action dated June 13, 2008 ("Office Action"). Claims 1, 3-7, and 11-14 have been amended to more clearly set forth the claimed invention. New claims 21-27 have been added to conform the claims to the embodiments of the invention, which are disclosed in the specification.

Support for the amendments to claims 1, 3-7, and 11-14 appears in the original claims and the specification on, e.g., paragraph [0049]. Support for the new claims 21-27 appear in the original claim and the specification on, e.g., FIG. 1. No new matter has been added. Applicant respectfully requests that the amendments be entered.

The Invention

Applicant hereby respectfully clarifies to the Examiner the inventions as follows: The outer primers (e.g., #4 and #5 in the example) are designed to amplify genomic DNA of a microorganism, which results in the first PCR product. The botin-conjugated inner primers (e.g., #6 and #7 in the example) are designed to amplify an inner fragment of the first PCR DNA product to obtain the 2nd PCR product. The nested PCR reaction is performed in a thermal cycler—PCR machine.

Reaction tubes containing probe-attached magnetic beads are washed at the top and/or bottom rows of the apparatus, which has 4 rows with 8 reaction containers per row as shown in FIG. 6.

After wash, the reaction tubes containing probe-attached magnetic beads are placed back to the inner rows, where there is no magnetic force. Hybridization buffer and the 2nd PCR DNA product are added into the tubes containing the probe-attached magnetic beads. An optimal temperature is provided and controlled to allow denaturation of DNA and hybridization of probe to the complementary strand. The probe is now attached to one strand of the 2nd PCR product. Now the reaction tubes contain all reactants, including beads, unbounded materials, non-specific PCR products, etc.

The reaction tubes are moved from the inner rows to top or bottom rows of the apparatus for washing.

After washing, the reaction tubes are moved back to the inner rows for resuspension in PBS for reacting with Streptavidin-HRP. Streptavidin-HRP is added, which will bind to the biotin labeled, 2nd PCR product. The above steps are performed on the inner rows of the apparatus.

In summary, reaction tubes are moved to the top and bottom rows of the apparatus for separation and washing of magnetic beads. Reaction tubes are moved to the inner rows of the apparatus for adding substrate and resuspending magnetic beads. Finally, the reaction tubes are moved to a light detector for measuring light emissions.

Thus, The instant application concerns inventions directed to a method for detecting a microorganism and an assay system includes (1) diagnostic kit; (2) an apparatus; and (3) a light detector.

The detection method of the invention requires the step of nested polymerase chain reaction, which is a modification of polymerase chain reaction intended to reduce the contaminations in products due to the amplification of unexpected primer binding sites. The

advantage of utilizing nested PCR with outer and inner pair of primers allows detection of a microorganism in a clinical specimen with high specificity and sensitivity.

The diagnostic kit requires, among others, an outer pair and inner pair of primers for performing nested PCR. The apparatus of the invention includes: (1) a means for fitting reaction containers that are arranged in multiple rows; (2) a means for thermal control; and (3) a means for providing magnetic force. The means for fitting reaction containers and the means for providing the magnetic force are integrated in the apparatus. The means for providing the magnetic force are integrated in the apparatus at the location outside the top and bottom rows of the reaction containers. The means for providing the magnetic force cause the magnetic beads to bind onto walls of the reaction containers at the top and bottom rows. The means for providing the magnetic force exert no magnetic force to the reaction containers at the inner rows and do not cause the magnetic beads to bind onto walls of the containers at the inner rows.

Claim Rejections – 35 U.S.C. §102/103

Claims 1-7 and 11-14 are rejected under 35 U.S.C. §102 as being anticipated by or, in the alternative, under 103(a) over Shimada (Rinsho Byori, Vol. 50, No. 5, pages 528-532, 2002).

Applicants respectfully traverse the rejections at least for the reasons set forth below.

MPEP § 2131.01 states that "[t]o anticipate a claim, the reference must teach every element of the claim."

In addition, MPEP §2143 states that "[t]he legal standard for establishing a prima facie case of obviousness requires that the references "teach or suggest all the claim limitations." *See* MPEP §2143. (Emphasis added)

Claim 1-7:

As amended, claims 1-7 require, among others, the following steps:

(b) performing the first polymer chain reaction (PCR) with an outer pair of primers using the genomic DNA as a template to obtain the first PCR DNA product; and

(c) performing the second PCR with an inner pair of primers using the first PCR DNA product as a template to obtain the second PCR DNA product.

Applicant respectfully submits that the claimed method is distinguishable from Shimada. Shimada teaches detection of M. tuberculoses genes by using a pair of chimeric primers whose 5'end is DNA and 3' end is RNA to carry out a PCR.

Shimada does not teach any detection method by using an outer pair and an inner pair of primers and carrying out two steps of PCR. Shimada does not disclose the step (b): performing the first PCR with an outer pair of primers using the genomic DNA as a template to obtain the first PCR DNA product; and the step (c): performing the second PCR with an inner pair of primers using the first PCR DNA product as a template to obtain the second PCR DNA product, which are required by the claimed invention.

Therefore, Shimada does not anticipate, or render obvious, Claims 1-7.

Claim 11-14:

As amended, Claims 11-14 requires, among others, **"an outer pair and inner pair of primers for performing the first and the second PCR, respectively, wherein at least one of the inner pair of primers is labeled by a DNA labeling agent."**

As aforementioned, Shimada teaches detection of M. tuberculoses genes by using a pair of chimeric primers whose 5'end is DNA and 3' end is RNA to carry out a PCR.

Shimada does not teach any M. tuberculosis gene detection method by using an outer pair and an inner pair of primers for carrying out two steps of PCR.

Therefore, Shimada does not anticipate, or render obvious, Claims 11-14.

Accordingly, Applicants respectfully request that the §102/103 rejections be withdrawn.

New claims 21-27

New claims 21-27 are not anticipated or rendered obvious by Shimada at least for the reason that they each depend from claim 1 or 11, each of which is novel and non-obvious over Shimada.

Moreover, new claims 21 and 22 further require the outer primes to comprise the sequence of SEQ ID NO: 8-9, and the inner primers to comprise the sequence of SEQ ID NO: 10-11, which is not taught or suggested by Shimada. Claim 27 further requires that primers do not contain ribose, which is clearly distinguishable from Shimada's express teaching.

Therefore, new claims 21-27 are patentable over Shimada as well.

Any amendments to the claims not specifically referred to herein as being included for the purpose of distinguishing the claims from cited references are included for the purpose of clarification, consistence and/or grammatical correction only.

It is thus believed that the application is in condition for allowance at least for the above reasons and such allowance is respectfully requested.

CONCLUSION

No fee is due because Applicants paid the filing fee for 3 independent claims and 20 total claims, and as set forth above, per this Amendment, there are 18 claims pending including 2 independent claims.

Applicants respectfully submit that the foregoing Amendment and Response place this application in condition for allowance. If the Examiner believes that there are any issues that can be resolved by a telephone conference to facilitate the prosecution of this application, or that there are any informalities that can be corrected by an Examiner's amendment, please call the undersigned at 650-557-4464.

Respectfully submitted,

September 5, 2008

/Hsiu-Ming Saunders /
Hsiu-Ming Saunders, Ph.D.
Attorney for Applicants on the Record
Reg. No. 47,055

IPC INTELLECTUAL PROPERTY CONNECTIONS, INC.
San Carlos, CA 94070
Tel: 650-557-4464
Mobile: 651-235-7129
Customer No. 74603